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EXAMINER	
EDWARDS, PATRICK L	

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2621	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/676,011	Applicant(s) MAURER, RON P.	
	Examiner Patrick L Edwards	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 2-36 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 4-7,13-16,20-22,26-28 and 32-34 is/are allowed.

6)☒ Claim(s) 2,3,8-12,17-19,23-25,29-31,35 and 36 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The response received on April 29 2004 has been placed in the file and was considered by the examiner. An action on the merits follows.

Response to Arguments

2. The applicant's arguments, filed on April 29 2004 , have been fully considered. A response to these arguments is provided below.

Prior Art Rejections

Applicant's Argument: Claims 4-7, 13-16, 20-22, 26-28 and 32-34, which were objected to for depending from rejected base claims, have been rewritten in independent form. The applicant argues that these claims should now be allowed.

Examiners Response: The examiner is persuaded that these claims are now allowable. The previous rejection of these claims is hereby withdrawn.

Applicant's Argument: Regarding claims 10, 23 and 29, the applicant argues that the claims recite an image sharpening method which is not disclosed in the prior art.

Examiners Response: In response to applicant's arguments, the recitation of an image sharpening method has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Applicant's Argument: Furhter regarding claims 10, 23 and 29, the applicant argues that Lee does not teach or suggest spatial filtering based on a variable range

Examiners Response: With regard to claims 10 and 23, the applicant's argument is considered irrelevant in that the Lee reference was not used to reject either of these claims. Regarding claim 29, the applicant's argument has been fully considered, but is not persuasive. The Lee reference discloses that the high and low clip points (which define the 'variable range' recited in the claim) are calculated from the background and object area of the image. For any given image, the intensity levels of the background and the object areas are variable. Consequently, the range which is defined by the high and low clip points as disclosed in Lee qualifies as a 'variable range' as recited in the claim.

Applicant's Argument: Regarding claims 10 and 23, the applicant argues that the claims should be allowed because Zimmerman's method is not a per-pixel method.

Examiners Response: The applicant's arguments have been fully considered, but are not persuasive. The Zimmerman reference explicitly discloses a per-pixel method (Zimmerman pg. 305 left column, final paragraph).

Applicant's Argument: The applicant has amended claims 2 and 17 and argues that these claims are now allowable over the references used in the prior rejection. More specifically the applicant argues that the prior art does not teach a contrast mapping function with a shape that depends on dynamic range of the lcoal pixel neighborhood.

Examiners Response: The applicant's arguments have been fully considered but are not persuasive. The Zimmerman reference clearly teaches a contrast mapping function (see Figure 1) which is performed on a local basis (Zimmerman pg. 305 left column final paragraph). Therefore the slope of the mapping region (i.e. the claimed 'shape of the mapping function') is dependent on the dynamic range of the local neighborhood (i.e. the 'local distribution of pixels' as disclosed in Zimmerman).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 17-19 and 36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17 recites "the mapping function". There is insufficient antecedent basis for this limitation in the claim.

Claims 18-19 and 36 are rejected because they are dependent on indefinite claims.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 10, 17 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Zimmerman et al. ("An Evaluation of the Effectiveness of Adaptive Histogram Equalization for Contrast Enhancement").

With regard to claim 10, Zimmerman discloses determining a dynamic range of a pixel neighborhood, where the dynamic range of a pixel neighborhood is based on a difference of minimum and maximum pixel values in the pixel neighborhood; and then performing contrast stretching on a pixel-by-pixel basis according to the corresponding dynamic range (Zimmerman pg. 305 left column, final paragraph). The "distribution of pixel intensities" as disclosed in Zimmerman is analogous to a dynamic range based on a difference of minimum and maximum pixel values as recited in the claim. The difference between the minimum and maximum pixel values of a region is well known in the art as the distribution of pixel intensities for the region. Applying the "histogram equalization mapping" as disclosed in Zimmerman is analogous to performing contrast stretching as recited in the claim. Also note that this is applied on a pixel-by-pixel basis and is determined according to the dynamic range of the local neighborhood.

With regard to claim 17, Zimmerman discloses determining dynamic ranges of pixel neighborhoods for the pixels of interest (Zimmerman pg. 305 left column, final paragraph). The local distribution of pixel intensities as disclosed in Zimmerman is analogous to the dynamic range as recited in the claim.

Zimmerman further discloses applying a contrast stretching function to each pixel of interest within the dynamic range of the corresponding pixel neighborhood (Zimmerman pg. 305 left column, final paragraph). The 'contrast enhancement mapping' disclosed in Zimmerman is analogous to the contrast stretching function recited in the claim.

Zimmerman further discloses that the mapping function (i.e. the 'contrast enhancement mapping' disclosed in Zimmerman) has a shape that depends on the dynamic range. It can easily be seen from the contrast enhancement function shown in Figure 1, (which can be applied locally as disclosed in pg. 305 left column final paragraph of Zimmerman), that the slope of the linear mapping region (analogous to the claimed 'shape' of the mapping function) depends on the dynamic range (i.e. the range of values defined by Wmin and Wmax).

Although Zimmerman does not explicitly state that a processor is performing these steps, a processor would have to exist in order for these operations to be performed. Therefore, a processor is inherent in Zimmerman's disclosure. Also inherent in Zimmerman is the further limitation that contrast stretching is performed on each pixel of interest "within" the dynamic range of the pixel neighborhood. Any pixel of interest in a local neighborhood inherently lies within the dynamic range of that neighborhood.

With regard to claim 36, this claim adds a functional limitation to anticipated apparatus. Consequently, this limitation is inherent in Zimmerman. Please see MPEP § 2114 for further information regarding functional limitations in apparatus claims.

7. Claim 29 is rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. (US Patent Number 5,361,308).

Lee discloses clipping pixel intensity values outside of a variable range and mapping pixel intensity values within the variable range (Lee column 5 lines 20-29). The linear ramp disclosed in Lee maps pixel intensity values within the range. The pixel intensity values outside this range are clipped. Lee discloses that this range is defined

by low and high clipping points which vary according to the intensity levels of the background and object area, respectively. Consequently, the mapping and clipping operation are done in accordance with a variable range.

A program stored in memory which causes the computer to execute the steps of a method is essential if the image processing method disclosed in Lee is to function. Therefore, a program stored in memory is inherent in the teachings of Lee.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 2, 3 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmerman in view of Lee.

With regard to claim 2, Lee discloses clipping pixel intensity values outside of a variable range and mapping pixel intensity values within the variable range (Lee column 5 lines 20-29). The linear ramp disclosed in Lee maps pixel intensity values within the range. The pixel intensity values outside this range are clipped. Lee discloses that this range is defined by low and high clipping points which vary according to the intensity levels of the background and object area, respectively. Consequently, the mapping and clipping operation are done in accordance with a variable range.

Lee, however, fails to disclose that this operation is performed using a local variable range which depends on the maximum and minimum intensity values of a local pixel neighborhood. Zimmerman, however, discloses performing this operation on a local level so that the clipping and mapping applied to the pixel intensity values is a function of the local maximum and minimum intensity values (i.e. the 'local distribution of pixel intensities') (Zimmerman pg. 305 left column final paragraph).

Also note that the mapping and clipping operation described in the Lee reference (Lee col. 5 lines 20-29) is visually shown in Figure 1 of the Zimmerman disclosure. This figure clearly shows that applying the mapping and clipping operation on a local basis as taught by Zimmerman (pg. 305 left column final paragraph) results in a mapping operation in which the shape (i.e. the slope of the linear ramp from Lee) depends on the dynamic range of the local pixel neighborhood.

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Lee's image processing method by determining the variable range on a pixel-by-pixel basis and as a function of a local

pixel neighborhood as taught by Zimmerman. Such a modification would have allowed for a method that clipped and mapped pixel intensity values on an adaptive basis rather than on the global information content of the image This would have made for a more robust system that could make objects of differing intensity value subranges simultaneously visible (Zimmerman pg. 305 left column, final paragraph).

With regard to claim 3, the combination of Lee and Zimmerman discloses an image processing system in which pixel values are mapped inside a variable range and clipped outside of a variable range. Said variable range being determined on a pixel-by-pixel basis as a function of the dynamic range of the local pixel neighborhood. Lee discloses calculating "low-clipping" and "high-clipping" points which determine the variable range. In such a system, the dynamic range a local pixel neighborhood would approach zero when the intensity values of all the pixels in the neighborhood were nearly the same. Consequently the low and high clipping points would be the same and the output intensity value of the target pixel would be the same as the input intensity. When the output values of a system are the same as the input values, this is well known in the art as mapping with a slope of unity. Consequently, this limitation, althought not explicitly disclosed, is inherent in the combination of Lee and Zimmerman.

Additionally, in a situation where there is a variance between the pixel values of a local neighborhood, we can say that the dynamic range of the neighborhood is greater than zero and there will be a positive difference between "low" and "high" clipping points . As a result, mapping the target pixel values using a slope greater than unity, although not expressly disclosed in the Lee and Zimmerman combination, is inherent in the system.
In addition, a greater dynamic range will result in "low" and "high" clipping points which are further apart and require a greater sloped line to map them together. As a result, the further limitation that the slope of the mapping function is a non-decreasing function of the dynamic range is inherent in the combination of Lee and Zimmerman.

With regard to claim 35, the combination of Lee and Zimmerman performs all of the steps of the recited image sharpening method. It follows that the combination of Lee and Zimmerman discloses image sharpening.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Lee and Zimmerman as applied to claim 2 above, and further in view of Gu (USPN 6,097,853).

The aforesaid combination discloses all of the limitations of claim 8, but does not expressly disclose the further limitation that the image is a color image and that the luminance channel is processed and then combined with the chrominance information. Gu, however, discloses performing sharpening on the luminance channel of a color image (Gu column 13 lines 9-11) and then combining the luminance channel of the image with the chrominance information (Gu column 14 lines 38-46). Gu does not explicitly state that the luminance and chrominance information is combined, but the cited passages in conjunction with Figure 2 show a system which performs processing on the isolated luminance channel and then performing processing on the image with color data included. As a result, the recombination of these signals is inherently taught.

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Lee's image processing system in order to include the sharpening of the luminance channel of a color image as taught by Gu. Such a modification would have allowed for a more robust sytem that could perform sharpening on color images.

11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Lee, Zimmerman and Gu as applied to claim 8 above, and further in view of Sani et al. (US Patent Application Publication 2003/0020830). The arguments as to the relevance of Lee, Zimmerman and Gu as applied above are incorporated herein.

The combination of Lee and Gu discloses sharpening a color image, but does not expressly disclose converting the image from RGB color space to YCbCr color space prior to sharpening. Sani, however, discloses converting a digital image from RGB color space to YCrCb color space prior to image processing (Sani paragraph 23 with Figures 1a and 1b).

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify the combination of Lee and Gu's color image sharpening system to include conversion of the color image from RGB color space to YCrCb color space prior to processing as taught by Sani. Converting the color space of the image prior to sharpening would have allowed for a conventional method of splitting the luminance and chrominance signals prior to sharpening (Sani paragraph 23).

12. Claims 11, 12, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmerman as applied to claims 10 and 17, and further in view of Zimmerman. The arguments as to the relevance of Zimmerman as applied above are incorporated herein.

Claim 11 incorporates all of the limitations of claim 10 and further adds the limitations that the contrast stretching is performed by clipping pixel values outside of a contrast range and mapping pixel values inside a contrast range. The embodiment of Zimmerman applied to claim 10 discloses performing a contrast stretching on a pixel of interest on the basis of the dynamic range of that pixel's local neighborhood. This embodiment also discloses mapping pixel intensity values. The embodiment fails to expressly disclose that the mapping is performed only on pixels within a contrast range and that the pixels outside of a contrast range are clipped.

Zimmerman, however, additionally discloses mapping the intensity values which fall within a given range, and clipping the intensity values which fall outside that range (Zimmerman pg. 304, right column, final paragraph). The sentence "Intensity values lying above or below the window are mapped to the maximum and minimum possible intensity values, respectively" is simply describing the operation of clipping as recited in the claim. Zimmerman teaches that this additional embodiment 'enhances contrast within a subrange of intensity values at the expense of the remaining values'.

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify the local adaptive, pixel-by-pixel method of contrast stretching shown in one embodiment of Zimmerman, by including the mapping and clipping operations as taught by the additional Zimmerman embodiment. Such a modification would have resulted in a contrast enhancing system in which intensity subranges could be adaptively enhanced on the basis of a target pixel's neighborhood pixel data. Consequently, the contrast enhancement operation would provide full enhancement of an image without any loss of information.

With regard to claim 12, the combination of the Zimmerman embodiments discloses a system in which mapping is adaptive to the local distribution of pixel intensities. As a result, we can conclude that a local pixel neighborhood which lacked a distribution of pixel intensities (dynamic range of zero) wouldn't be mapped at all. Rather, the ouput would simply be the same as the input. When the output values of a system are the same as the input values, this is well known in the art as mapping with a slope of unity. Consequently, this limitation, althought not explicitly disclosed, is inherent in the combination of the Zimmerman embodiments.

Since the contrast enhancing operation is based on the local distribution of pixel intensities about a target pixel, we can conclude that a distribution with a greater magnitude will result in a target pixel being mapped with a greater magnitude. Consequently, we can conclude that the mapping slope is greater than unity when the dynamic range is greater than zero and the slope is a non-decreasing function of the dynamic range. Although not expressly disclosed, these limitation are inherently taught by the combination of Zimmerman embodiments.

With regard to claims 18 and 19, all of the limitations of the claims have been addressed in the above arguments, but Zimmerman fails to explicitly state that a processor is performing the operations. However, a processor would have to exist in order for these operations to be performed. Therefore, a processor is inherent in Zimmerman's disclosure.

13. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burke (USPN 5,042,077) in view of Zimmerman.

With regard to claim 23, Burke discloses determining a contrast range for each pixel of interest in a digital image, clipping intensity values of pixels of interest if they lie outside a contrast range and mapping intensity values of pixels of interest which lie within the contrast range (Burke column 2 lines 34-50). The contrast window disclosed in Burke is analogous to contrast range as recited in the claim. This embodiment of Burke fails to expressly disclose that this contrast range is determined on a pixel-by-pixel basis. Zimmerman, however, discloses determining a contrast range on a pixel-by-pixel basis (Zimmerman pg 305 left column, final paragraph). The claim also recites an apparatus for performing these operations. A processor would have to exist in order for these operations to be performed. Therefore, a processor is inherently taught in the combination of Burke and Zimmerman.

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify the sharpening (contrast enhancing) method of mapping and clipping pixel intensity values disclosed in Burke, by

determining a contrast range on a pixel-by-pixel basis as taught by Zimmerman. Such a modification would have allowed for a contrast enhancement method that could be adaptively performed on the basis of pixel values in a local pixel neighborhood. This would have resulted in a contrast enhancement method that would automatically vary the enhancement for different types of image regions.

With regard to claim 24, Zimmerman discloses that contrast range is a function of a dynamic range of a local pixel neighborhood and is determined on a pixel-by-pixel basis (Zimmerman pg. 305 left column final paragraph). The contextual region disclosed in Zimmerman is analogous to the local pixel neighborhood as recited in the claim. The "local distribution of pixel intensities" disclosed in Zimmerman is analogous to the dynamic range recited in the claim.

With regard to claim 25, the combination of Burke and Zimmerman discloses a system in which mapping is adaptive to the local distribution of pixel intensities. As a result, we can conclude that a local pixel neighborhood which lacked a distribution of pixel intensities (dynamic range of zero) wouldn't be mapped at all. Rather, the ouput would simply be the same as the input. When the output values of a system are the same as the input values, this is well known in the art as mapping with a slope of unity. Consequently, this limitation, althought not explicitly disclosed, is inherent in the combination of Burke and Zimmerman.

Since the contrast enhancing operation is based on the local distribution of pixel intensities about a target pixel, we can conclude that a distribution with a greater magnitude will result in a target pixel being mapped with a greater magnitude. Consequently, we can conclude that the mapping slope is greater than unity when the dynamic range is greater than zero and the slope is a non-decreasing function of the dynamic range. Although not expressly disclosed, these limitation are inherently taught by the combination of Burke and Zimmerman.

14. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as applied to claim 29 above, and further in view of Zimmerman. The arguments as to the relevance of Lee as applied above are incorporated herein.

Referring to claim 30, Lee discloses a variable range but not does not expressly disclose that the variable range for each pixel is a function of dynamic range of a local pixel neighborhood and is determined on a pixel-by-pixel basis. Zimmerman, however, discloses determining variable range on a pixel-by-pixel basis and as a function of the dynamic range of a local pixel neighborhood (Zimmerman pg. 305, left column, final paragraph). The "local distribution of pixel intensities" in a "contextual region" as disclosed in Zimmerman is analogous to the dynamic range of a local pixel neighborhood as recited in the claim.

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Lee's image processing method by determining the variable range on a pixel-by-pixel basis and as a function of a local pixel neighborhood as taught by Zimmerman. Such a modification would have allowed for a method that clipped and mapped pixel intensity values on an adaptive basis rather than on the global information content of the image

This would have made for a more robust system that could make objects of differing intensity value subranges simultaneously visible (Zimmerman pg. 305 left column, final paragraph).

With regard to claim 31, the combination of Lee and Zimmerman discloses an image processing system in which pixel values are mapped inside a variable range and clipped outside of a variable range. Said variable range being determined on a pixel-by-pixel basis as a function of the dynamic range of the local pixel neighborhood. Lee discloses calculating "low-clipping" and "high-clipping" points which determine the variable range. In such a system, the dynamic range a local pixel neighborhood would approach zero when the intensity values of all the pixels in the neighborhood were nearly the same. Consequently the low and high clipping points would be the same and the output intensity value of the target pixel would be the same as the input intensity. When the output values of a system are the same as the input values, this is well known in the art as mapping with a slope of unity. Consequently, this limitation, althought not explicitly disclosed, is inherent in the combination of Lee and Zimmerman.

Additionally, in a situation where there is a variance between the pixel values of a local neighborhood, we can say that the dynamic range of the neighborhood is greater than zero and there will be a positive difference between "low" and "high" clipping points . As a result, mapping the target pixel values using a slope greater than unity, although not expressly disclosed in the Lee and Zimmerman combination, is inherent in the system.

In addition, a greater dynamic range will result in "low" and "high" clipping points which are further apart and require a greater sloped line to map them together. As a result, the further limitation that the slope of the mapping function is a non-decreasing function of the dynamic range is inherent in the combination of Lee and Zimmerman.

Allowable Subject Matter

15. Claims 4-7, 13-16, 20-22, 26-28 and 32-34 are allowed.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Felmlee et al (USPN 5,900,732), discloses a mapping and clipping operation which is based on local dynamic range
- Fahnestock et al. ("spatially variant contrast enhancement using local range modification"), discloses contrast mapping which is based on local dynamic range.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick L Edwards whose telephone number is (703) 305-6301. The examiner can normally be reached on 8:30am - 5:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick Lynn Edwards

Art Unit 2621

ple

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